2 ~~42~~. The method of Claim ~~41~~ 1, wherein said Factor VIII protein is expressed in the liver.

3 ~~43~~. The method of Claim ~~41~~ 1, wherein said recombinant adeno-associated virus virions are administered to the liver.

4 ~~44~~. The method of Claim ~~41~~ 1, wherein said expression control elements comprise a tissue-specific promoter.

5 ~~45~~. The method of Claim ~~44~~ 4, wherein said expression control elements comprise a liver-specific promoter.

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6 ~~46~~. The method of Claim ~~41~~ 1, wherein said expression control elements comprise a human growth hormone polyadenylation sequence.

7 ~~47~~. The method of Claim ~~41~~ 1, wherein said recombinant adeno-associated virus virions are administered via intravenous administration.

8 ~~48~~. The method of Claim ~~47~~ 7, wherein said intravenous administration is via the portal vein.

9 ~~49~~. The method of Claim ~~41~~ 1, wherein said recombinant adeno-associated virus virions are administered via intraarterial administration.

10 ~~50~~. The method of Claim ~~49~~ 9, wherein said recombinant adeno-associated virus virions are administered via the hepatic artery.

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51. The method of Claim 41, wherein said nucleotide sequence encoding Factor VIII comprises a light chain and a heavy chain and wherein said light chain and heavy chain are operably linked by a junction.

52. The method of Claim 51, wherein said nucleotide sequence is SEQ ID 13, such that said junction has the amino acid sequence Ser-Phe.

53. The method of Claim 51, wherein said nucleotide sequence is SEQ ID 14, such that said junction has the amino acid sequence Ser-Phe-Ser-Gln-Asn-Pro-Pro-Val-Leu-Lys-Arg-His-Gln-Arg.

54. The method of Claim 51, wherein said expression control elements comprise a liver-specific promoter, and wherein said recombinant adeno-associated virus virions are administered to the liver of said mammal.

55. The method of Claim 53, wherein said expression control elements comprise a liver-specific promoter, and wherein said recombinant adeno-associated virus virions are administered to the liver of said mammal.

56. A method of treating hemophilia in a mammal, said method comprising:

a. providing a first recombinant adeno-associated virus virion comprising a nucleotide sequence encoding the light chain of Factor VIII operably linked to expression control elements; and

b. providing a second recombinant adeno-associated virus virion comprising a nucleotide sequence encoding the heavy chain of Factor VIII operably linked to expression control elements; and

c. administering said first and second recombinant adeno-associated virus

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virions to a mammal under conditions that result in the expression of Factor VIII protein at a level that provides a therapeutic effect in said mammal.

17 ~~57~~. The method of Claim ~~56~~ 16, wherein said Factor VIII protein is expressed in the liver.

18 ~~58~~. The method of Claim ~~56~~ 16, wherein said recombinant adeno-associated virus virions are administered to the liver.

19 ~~59~~. The method of Claim ~~56~~ 16, wherein said expression control elements comprise a tissue-specific promoter.

20 ~~60~~. The method of Claim ~~59~~ 19, wherein said expression control elements comprise a liver-specific promoter.

21 ~~61~~. The method of Claim ~~56~~ 16, wherein said expression control elements comprise a human growth hormone polyadenylation sequence.

22 ~~62~~. The method of Claim ~~56~~ 16, wherein said recombinant adeno-associated virus virions are administered via intravenous administration.

23 ~~63~~. The method of Claim ~~62~~ 22, wherein said intravenous administration is via the portal vein.

24 ~~64~~. The method of Claim ~~56~~ 16, wherein said recombinant adeno-associated virus virions are administered via intraarterial administration.

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25 65. The method of Claim 64, wherein said recombinant adeno-associated virus virions are administered via the hepatic artery.

66. A method of treating hemophilia in a mammal, said method comprising:

a. identifying in said mammal the domains of Factor VIII that are functional;

b. providing recombinant adeno-associated virus virions comprising nucleotide sequences encoding said domains of Factor VIII, said domains selected from the group consisting of A1, A2, A3, B, C1, and C2; and

c. administering said recombinant adeno-associated virus virions to a mammal under conditions that result in the expression of Factor VIII protein at a level that provides a therapeutic effect in said mammal.

67. The method of Claim 66, wherein said recombinant adeno-associated virus virions comprise a nucleotide sequence encoding Factor VIII domains A1 and A2.

68. The method of Claim 66, wherein said recombinant adeno-associated virus virions comprise a nucleotide sequence encoding Factor VIII domains A3, C1, and C2.

69. The method of Claim 66, wherein said Factor VIII protein is expressed in the liver.

70. The method of Claim 66, wherein said recombinant adeno-associated virus virions are administered to the liver.

71. The method of Claim 66, wherein said expression control elements comprise a tissue-specific promoter.

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72. The method of Claim 71, wherein said expression control elements comprise a liver-specific promoter.

73. The method of Claim 66, wherein said expression control elements comprise a human growth hormone polyadenylation sequence.

74. The method of Claim 66, wherein said recombinant adeno-associated virus virions are administered via intravenous administration.

75. The method of Claim 74, wherein said intravenous administration is via the portal vein.

76. The method of Claim 66, wherein said recombinant adeno-associated virus virions are administered via intraarterial administration.

77. The method of Claim 68, wherein said recombinant adeno-associated virus virions are administered via the hepatic artery.

78. The method of Claim 67, wherein said expression control elements comprise a liver-specific promoter, and wherein said recombinant adeno-associated virus virions are administered to the liver of said mammal.

79. The method of Claim 68, wherein said expression control elements comprise a liver-specific promoter, and wherein said recombinant adeno-associated virus virions are administered to the liver of said mammal.